

# Notice of Allowability

Application No.

10/022,189

Examiner

Brian J. Sines

Applicant(s)

HUANG ET AL.

Art Unit

1743

## -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the response filed 6/21/2004.
2. ☒ The allowed claim(s) is/are 47-91.
3. ☒ The drawings filed on 12/18/2001 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☐ All    b) ☐ Some\*    c) ☐ None    of the:
    1. ☐ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
  6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
    - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
    - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

### Attachment(s)

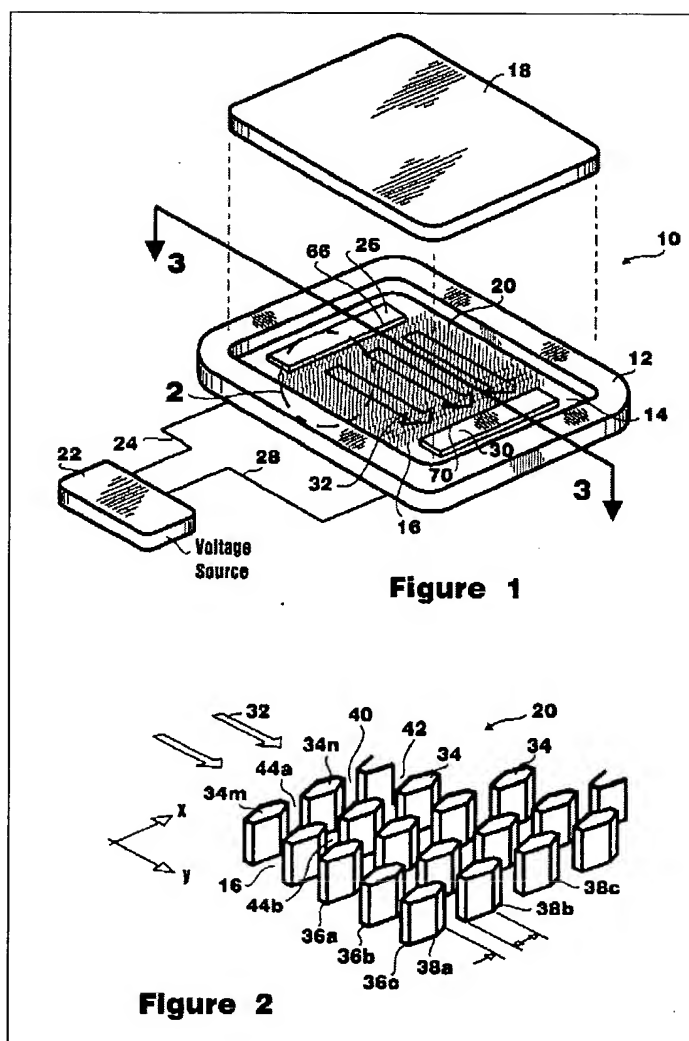
- |   |  |
|---|--|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892)  | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)            |
| 2. <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)                                 | 6. <input type="checkbox"/> Interview Summary (PTO-413),<br>Paper No./Mail Date _____. |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),<br>Paper No./Mail Date _____ | 7. <input type="checkbox"/> Examiner's Amendment/Comment                               |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit<br>of Biological Material          | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance   |
|   | 9. <input type="checkbox"/> Other _____.   |

**DETAILED ACTION*****Allowable Subject Matter***

Claims 47 – 91 are allowed.

The following is an examiner's statement of reasons for allowance:

Ohkawa (U.S. Pat. No. 6,027,623 A) teaches a method and apparatus (10) for fractionating charged macromolecules, such as DNA, wherein the apparatus comprises an array or matrix of obstacles (34) (see col. 4, lines 45 – 67 & col. 5, lines 1 – 57; figures 1 & 2).



Regarding claim 47, the cited prior art neither teach nor fairly suggest a method of continuously fractionating charged macromolecules, wherein the method comprises the step of applying an asymmetric electric field to the matrix in which the applied electric field is alternating in direction as a function of time at a location in the matrix, and which has a time average of an electric field vector over many cycles, whereby the time integral of the vector at the same location over a part of the cycles when the electric field is instantaneously pointing to one side of the vector is not spatially symmetric about the vector with the time integral of the vector over another part of the cycles at the same location when the electric field is instantaneously pointing to another side of the vector.

Regarding claim 61, the cited prior art neither teach nor fairly suggest a method of continuously fractionating charged macromolecules, wherein the method comprises the step of applying an asymmetric field to the matrix in which the matrix time-dependent electric fields whose odd-order integrals over time are not at the time-average field orientation for every  $n$ , where  $n$  is any positive even integer.

Regarding claim 74, the cited prior art neither teach nor fairly suggest a method of continuously fractionating charged macromolecules, wherein the method comprises the step of applying an asymmetric electric field in which the first and second electric pulses of the first and second waveforms are alternated; maintaining the integral over time of one of the first and second pulses' amplitudes are larger than that of the other pulses; and applying the first and second electric pulses at first and second fixed orientations.

Regarding claim 86, the cited prior art neither teach nor fairly suggest a method of continuously fractionating charged macromolecules, wherein the method comprises the step of

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varying the field orientation with time to create an asymmetrical electric field in which the field orientation is varied with time in such a manner that the recited integral of  $\theta(t)$  is not zero for every  $n$ , and where  $\theta(t)$  is a field orientation with respect to the time-average field orientation, and  $n$  is any integer larger than zero.


Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

### *Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian J. Sines, Ph.D. whose telephone number is (571) 272-1263. The examiner can normally be reached on Monday - Friday (11 AM - 8 PM EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill A. Warden can be reached on (571) 272-1267. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Jill Warden  
Supervisory Patent Examiner  
Technology Center 1700